Northern Saskatchewan Environmental Industry Study

SUBMITTED BY:

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FINAL REPORT 2002

EXECUTIVE SUMMARY

Introduction

In the last twenty-five years environmental awareness has increased on both the national and international level. Environment, an area originally of interest for environmentalists, has become a regulated field that concerns the general public, government, and industry. Due to the industry's young age there is a need to examine its composition, resource needs, and potential for job creation. As an industry with great prospects it is very important for Saskatchewan to investigate employment and investment opportunities. The main challenge facing the environmental sector is providing post secondary programs to meet the skill sets required by industry.

As a result of these changes and challenges, there is a need to generate a common understanding of the human resource and training needs of the industry. AMEC Earth & Environmental Limited (AMEC), on behalf of SEIMA and the environmental industry, received funding from Saskatchewan Post Secondary Education and Skills Training through the Sector Partnership Program to assist in the Northern Saskatchewan Environmental Industry Sector Partnership. A Steering Committee was formed to work with and provide direction to AMEC in carrying out the research component, analysis, and needs assessment for planning human resource requirements for the environmental industry in northern Saskatchewan.

Objectives

AMEC, on behalf of the environmental industry, conducted a needs analysis to research and address human resource requirements for environmental work in northern Saskatchewan and undergraduate (or equivalent) environmental training programs available. The results of this study will provide a document for use by Saskatchewan industry and post secondary education to assess the future requirements of the industry and the training programs available to meet industry's needs. The initiatives resulting from this project will affect companies outside northern Saskatchewan. Some of the conclusions of this report can be considered encompassing of the whole province and transferable to the south.

Methodology

The Northern Saskatchewan Environmental Industry Sector Partnership Steering Committee was established and mandated with the responsibility for overseeing and directing all project activities to ensure project objectives were achieved, and providing direction for various research components, survey development and the final report.

Background information needed for this study was obtained through a literature review.

For the purposes of this study, northern Saskatchewan was defined as the area north of and encompassing La Ronge, although certain businesses in Regina and Saskatoon were included in the survey because they were thought to do environmental work in the North. For this study, Environmental Industry Businesses were defined as businesses that:

1. Hire people with environmental knowledge and/or skills,
2. Are involved in environmental protection or conservation; and
3. May impact the environment and/or participate in abatement practices.

A survey was drafted by AMEC, reviewed by the Steering Committee and subsequently modified by AMEC. The survey was mailed out to businesses and/or industries that

complete environmental work, or whose activities impact the environment, according to the definition developed for this study. A representative sample was taken of approximately half of the businesses. Follow up phoning occurred from April 16 until April 20.

A list of Canadian educational institutions was compiled through Internet and telephone research. Calendars from each institution were obtained and a list of relevant undergraduate or equivalent programs assembled. A summary of environmental programs offered at institutions in Western Canada, including British Columbia, Alberta, Saskatchewan, and Manitoba was compiled. Details of training programs offered in Saskatchewan were gathered, including: length, achievement, a brief summary, possible specializations or options, and accreditation, if applicable.

A Focus Group, consisting of northern Saskatchewan businesses environmental personnel from the forestry, mining and environmental services, was surveyed in December 2001 to obtain industry validation for the study.

Key Findings

Key findings from the literature review, educational databases, and survey are condensed for review in this Executive Summary.

The environmental industry is a multidisciplinary one employing: chemists, engineers, biologists, geographers, geologists, agrologists, planners, technologists, and people with backgrounds in environmental studies, business administration, health and safety, computer programming, and humanities. There is a need for employees with a wide range of skills due to the prevalence of small businesses in the industry and the broad spectrum of activities performed by these companies.

In general, the environmental industry is characterized as an emerging sector, dominated by small to medium enterprises. The sector is constantly changing, with new legislation and regulations being introduced as awareness increases. The development of technology is a rapidly evolving area. As a result of this constant change, small, under-capitalized companies may find it increasingly difficult to develop and enhance their business. As the industry expands, it is important for small businesses to network. By sharing ideas and funding for training, businesses can make their needs heard by educational facilities. The majority of businesses reported that their environmental employees received training from universities or technical colleges, with 36% and 30%, respectively, and 89% of respondents reported on the job training. Meeting these training requirements warrants cooperation between industry and educational facilities.

The environmental industry in Saskatchewan is expanding. For northern Saskatchewan, this may lead to a shortage of qualified employees. This is especially true as the majority of employees are in the 45 – 54 age range and may be nearing retirement, and therefore other employees will needed to take their place.

According to the Focus Group responses:

- "there is a major need for (environmental) training and education."
- "most environmental work is becoming quite complex."
- "adequately trained/certified human resources from northern Saskatchewan are limited."

In northern Saskatchewan, 60% of businesses that require environmental personnel have some level of aboriginal participation in their organization, 15% of businesses are 100% aboriginally owned, and 40% of businesses employing aboriginals have a majority of aboriginal employees. It is necessary that training be applicable to First Nations, and Northern issues.

The greatest number of environmental employees in Saskatchewan was noted in the areas of environmental assessment (28%) and biological resources (31%). The largest expansion is indicated in the area of biological resources with 22% of companies suggesting the hiring of more full time and part time employees; this area is expected to see a 6% increase in positions.

The handling of wastes and dangerous goods was highlighted as an area where more training is required. In regards to ecotourism, business startup and hospitality training is needed. Knowledge of regulations in the industry is also essential. A few respondents indicated the need for short courses to be available in the North. Several others pointed out that their employees are continually trained in order to "keep abreast of current trends, findings and systems".

There are 46 educational institutions in Western Canada offering environmental training. 42 environmental undergraduate or equivalent programs are offered at six facilities in Saskatchewan. In order to meet human resource needs in the north, these programs need to deal specifically to northern and aboriginal issues. To improve qualifications of northern employees, training programs need to be offered directly in the north and in cooperation with business. This may increase the number of educated people working and staying in the north. It will also improve the economic base of the area, as the quality of business will improve with the employees.

Recommendations
The following recommendations are based on the results of the research and developed in consultation with the Steering Committee.

1. Communication: The results of the human resource and training needs assessment and the recommendations of the Steering Committee should be publicized. The executive summary should be forwarded to stakeholders, both business and educational, with the complete report being made available to those requesting it.

2. Demographics: The data compiled in the human resource and training needs assessment requires further analysis on a provincial level.

3. Sustainability: A course of action must be developed in order to ensure that the process started by the Northern Saskatchewan Environment Industry Sector Partnership Steering Committee continues.

4. Aboriginal Strategies: The industry needs to develop and enhance a partnership with aboriginal educational facilities, and organizations.

5. Partnerships: Partnerships within the industry need to be improved. Small companies must network amongst themselves to share ideas and funding. Co-operation between business and training providers can improve educational programs and employability. The Steering Committee should expand to include additional stakeholders. Northern and

aboriginal groups should be involved in order to address the specific needs of the North, and to collaborate on a provincial level.

6. Awareness: The educational system needs to recognize career opportunities within the environment industry. Businesses need to become more educated on the types of training programs offered.

7. Skill Shortages: Potential shortages of employees are identified in the following three management areas: waste, water, and biological resource management. Industry needs to identify the necessary skills in these areas and communicate these needs to educational institutions, which should address these priority training needs.

Next Steps

In order to ensure that the work begun under the Sector Partnership initiative is continued, the committee has identified the following first steps to be undertaken:

1. Develop a communication strategy by circulating this document to key stakeholders and encouraging a dialogue among them in regards to the issues raised.

2. Explore partnerships with organizations, such as Post Secondary Education and Skills Training, Human Resources Development Canada, and the Aboriginal Relations Office, and request assistance implementing the proposed strategy and recommendations.

3. Explore partnerships with SEIMA and CCHREI in order to develop new strategies and recommendations specific to the environment industry, as well as identifying options for industry-driven funding for training.

4. Expand and strengthen the Environmental Industry Sector Partnership for the continuation and sustainability of long term human resource planning.

5. Skills inventory by industry to identify gaps and strategies on behalf of education providers to address the gaps.

6. Industry and stakeholders need to work together to develop and implement recruitment strategies to promote educational and career opportunities to encourage youth and aboriginal persons to enter this industry.

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The following are the members of the Northern Saskatchewan Environmental Industry Sector Partnership Steering Committee. We would like to acknowledge the work of the Steering Committee members; input and direction were very helpful and most appreciated in the development of this report.

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1.0 INTRODUCTION

In the last twenty-five years environmental awareness has increased on both the national and international level. Environment, an area originally of interest for environmentalists, has become a regulated field that concerns the general public, government, and industry. Due to the industry's young age there is a need to examine its composition, resource needs, and potential for job creation. As an industry with great prospects it is very important for Saskatchewan to investigate employment and investment opportunities. The main challenge facing the environmental sector is providing post secondary programs to meet the skill sets required by industry.

Industry is changing and evolving as a result of legislations, regulations, standards, and new technology. As a result, new skill sets are required of the environmental industry labour force. In addition, the environmental industry plays an important role in Northern Saskatchewan's economy, through investment, job creation, exports, and preservation and conservation of natural resources. There is a need to address the training needs of aboriginal people and Northerners to prepare them to compete in this growth industry.

In the wake of all the water quality issues arising, there are many opportunities for employment in the areas of water quality and waste management. Especially in the north, there is a stated need for environmental health officers and incentives to keep them in the north. The trend here is for environmental health officers to stay for a maximum of two years, they get experience and then take it somewhere else. Unless they are from the area, there is a high likelihood that this will occur, reiterating the need to train Northerners.

As a result of these changes and challenges, there is a need to generate a common understanding of the human resource and training needs of the industry. AMEC Earth & Environmental Limited (AMEC), on behalf of the environmental industry, received funding from Saskatchewan Post Secondary Education and Skills Training through the Sector Partnership Program to assist in the Northern Saskatchewan Environmental Industry Sector Partnership. A Steering Committee was formed to work with and provide direction to AMEC in carrying out the research component, analysis, and needs assessment for planning human resource requirements for the environmental industry in northern Saskatchewan.

2.0 OBJECTIVES

AMEC, on behalf of the environmental industry, conducted a needs analysis to research and address human resource requirements for environmental work in northern Saskatchewan and undergraduate (or equivalent) environmental training programs available. The results of this study will provide a document for use by northern Saskatchewan industry and post secondary education to assess the future requirements of the industry and the training programs available to meet industry's needs. The initiatives resulting from this project will affect companies outside northern Saskatchewan. Some of the conclusions of this report can be considered encompassing of the whole province and transferable to the south.

For the purposes of this study, northern Saskatchewan was defined as the area north of and encompassing La Ronge, although certain businesses in Regina and Saskatoon were included in the survey because they were thought to do environmental work in the North. For this study, Environmental Industry Businesses were defined as businesses that:

3. Hire people with environmental knowledge and/or skills,
4. Are involved in environmental protection or conservation; and
5. May impact the environment and/or participate in abatement practices.

2.1 Scope Of Work

The scope of work provided by this study was as follows:

- Development of the Northern Saskatchewan Environmental Industry Sector Partnerships (Steering Committee) for the project.
- Collection and review of existing literature pertaining to the environmental industry in northern Saskatchewan.
- Survey of current northern Saskatchewan industry and human resource requirements for environmental work.
- Collection and review of educational programs available at post secondary institutions in Canada.
- Documentation of results in a report for industry and post secondary education to assess the current and future human resource needs.

3.0 METHODOLOGY

3.1 Sector Partnership

The Northern Saskatchewan Environmental Industry Sector Partnership Steering Committee was established and mandated with the responsibility for overseeing and directing all project activities to ensure project objectives were achieved, and providing direction for various research components, survey development and the final report. The Northern Saskatchewan Environmental Industry Sector Partnership Steering Committee included representation from:

- CanNorth Environmental Services;
- CETAC – West;
- Odaat Inc.;
- Saskatchewan Environment and Resource Management;
- Saskatchewan Environment Industry Managers Association;
- Saskatchewan Indian Federated College at the University of Regina;
- Saskatchewan Institute of Applied Sciences and Technology;
- Saskatchewan Northern Affairs;
- Saskatchewan Post-Secondary Education and Skills Training; and
- University of Saskatchewan.

3.2 Northern Saskatchewan Environmental Industry Overview

Background information needed for this study was obtained through a literature review. Reports reviewed for the assessment included:

- A Profile of the Canadian Environment Industry and its Human Resources;
- A Survey of the Environmental Industry in Northern Saskatchewan;
- Human Resources in the Canadian Environmental Sectors;
- Northern Saskatchewan Regional Training Needs Assessment Report;
- Saskatchewan Economic and Labour Market Overview 2000;
- Saskatchewan Forestry Sector Partnership;
- SIAST Regional Training Needs Assessment 1999; and
- Various CCHREI studies.

The results of the literature review are found in Section 4.0.

3.3 Northern Saskatchewan Environmental Industry And Human Resource Assessment

A survey was drafted by AMEC, reviewed by the Steering Committee and subsequently modified by AMEC. The survey was mailed out to businesses and/or industries that complete environmental work, or whose activities impact the environment, according to the definition developed for this study. Research was completed to develop a database of the environmental industry in Northern Saskatchewan, providing an understanding of the size and complexity of the sector. The Saskatchewan Business Directory was consulted in order to obtain a complete listing of all businesses that were located in and north of La Ronge as well as those in Regina and Saskatoon thought to do environmental work in northern Saskatchewan. Regina and Saskatoon were also included as companies in the south may have similar needs, and the results may be considered transferable. Businesses were categorized by location and sector, as follows:

Locations:

Air Ronge
Beauval
Buffalo Narrows
Canoe Narrows
Dillon
Fond Du Lac
Ile-A-La Crosse
La Loche
La Ronge
Patuanak
Pelican Narrows
Pinehouse Lake
Prince Albert
Rabbit Lake
Regina
Sandy Bay
Saskatoon
Stanley Mission
Stony Rapids
Wollaston Lake

Sectors:

Community/Municipality
Construction
Ecotourism
Engineering/Consulting
Environmental Services
Excavating
Forestry
Government
Mining
Oil and Gas
Recycling/Waste Management
Transport
Water
Other

A representative sample was taken of approximately half of the businesses in each sector in each location. A survey was sent to every business in smaller locations and/or sectors. Surveys were sent to Regina and Saskatoon, as the locations of head offices. Businesses were requested to return surveys by fax. Follow up phoning occurred from April 16 until April 20. The results of the survey are summarized in Section 5.0.

A total of 184 surveys were mailed out to businesses in the following locations:

TABLE 1
Location and Response of Survey Mail Out

Location	# of Surveys Sent	# of Respondents
Air Ronge	7	1
Beauval	5	-
Buffalo Narrows	4	2
Canoe Narrows	2	1
Dillon	1	-
Fond Du Lac	2	-
Ile-A-La Crosse	4	-
La Loche	5	-
La Ronge	19	11
Patuanak	1	-
Pelican Narrows	3	-
Pinehouse Lake	4	-
Prince Albert	1	-
Rabbit Lake	1	-
Regina	42	15
Sandy Bay	4	-
Saskatoon	60	17
Stanley Mission	3	1
Stony Rapids	2	-
Wollaston Lake	3	-
Other (i.e. bands, towns)	10	3
Total	**184**	**51**

3.4 Environmental Training Programs Database

A list of Canadian educational institutions was compiled through Internet and telephone research. Calendars from each institution were obtained and a list of relevant undergraduate or equivalent programs assembled. This catalog of educational institutions and programs is in Section 6.1. A summary of environmental programs offered at institutions in Western Canada, including British Columbia, Alberta, Saskatchewan, and Manitoba is available in Section 6.2. Section 6.3 provides details of training programs offered in Saskatchewan, including: length, achievement, a brief summary, possible specializations or options, and accreditation, if applicable.

4.0 CANADIAN ENVIRONMENTAL INDUSTRY OVERVIEW

In general, the environmental industry is characterized as an emerging sector, dominated by small to medium enterprises. The sector is constantly changing, with new legislation and regulations being introduced as awareness increases. The development of technology is a rapidly evolving area. As a result of this constant change, small, under-capitalized companies may find it increasingly difficult to develop and enhance their business.

The definitions of what the environmental industry is, vary widely. The traditional definition included mainly natural resource based sectors such as mining, forestry, and agriculture. It is important for the industry to expand its self-definition due to the implications it has on other sectors. The environmental sector can be considered an enabling sector; some aspect of it is incorporated into every other industry. As environmental awareness increases, it impacts additional aspects of all business. The Canadian Council for Human Resources in the Environment Industry (CCHREI) identifies business activities associated with the manufacturing or supply of a broad variety of goods and services. It divides the industry into three sectors:

1. environmental protection,
2. conservation and preservation of natural resources; and
3. environmental education, communications and research.

For the purposes of this study, the environmental industry was defined as businesses that:

1. Hire people with environmental knowledge and/or skills,
2. Are involved in environmental protection or conservation; and
3. May impact the environment and/or participate in abatement practices.

According to Statistics Canada, the environment industry in Canada consisted of 4700 companies, employing 150,000 people. Saskatchewan accounts for 4% of these companies with 187 and 2% of this employment with 2339 people. The Statistics Canada definition of an environmental company contained 35 sectors including, but not limited to:

- waste management,
- construction,
- engineering,
- business services; and
- wholesale.

4.1. Types And Size Of Businesses

Small companies, with less than ten employees, dominate employment in the environmental industry. These companies employ approximately 74% of the environmental workforce and account for Cdn $1.3 billion or 12.8% of the total revenues of the environmental industry.[1]

[1] Canadian Council for Human Resources in the Environment Industry. *Human Resources in the Canadian Environmental Sectors: Final Report2000.*

Businesses that fall under the definition of the environment industry are involved in traditional natural resource fields as well as research and development seeking solutions to local problems. These include:

- resource management,
- environmental impact assessment and mitigation,
- conservation,
- waste management and recycling technologies,
- technology development,
- remediation,
- reclamation,
- aesthetics,
- transportation, storage, and disposal of dangerous good,
- air, water, soil, and noise pollution control; and
- regulation, monitoring, and compliance.

4.2 Employment And Training

The environmental industry has a highly skilled workforce. According to CCHREI, in 1998 the Canadian environmental workforce was estimated at 221,000: 102,000 of these employees were environmental practitioners with university degrees or college diplomas; 119,000 were employed in a technical capacity. The environmental industry is a multidisciplinary one employing: chemists; engineers; biologists; geographers; geologists; agrologists; planners; technologists; and people with backgrounds in environmental studies; business administration; health and safety; computer programming; and humanities.

The training requirements of the environment industry vary widely. Due to the fact that the industry is dominated by small companies, employing ten or fewer people, there is a need for employees with a wide range of skills. The small size of companies requires multitasked employees (es: environmental specialists are also required to be office administrators). Small companies are also less able to train their employees, due to limited resources, and require educational institutions to produce employment-ready graduates. The implications of not meeting training needs affect both educational institutions and industry businesses. If appropriate programming cannot be found in Saskatchewan, people will go elsewhere, not likely to return. This is a loss for both Saskatchewan educational institutions and businesses. It also facilitates takeovers by multinational corporations, weakening Saskatchewan's economic base.[2]

4.3 Partnerships

With small businesses having limited resources, it is important for the industry to form partnerships. Cooperation between businesses can result in the sharing of important information and ideas. It is necessary to strengthen networks to improve communications within the sector by creating opportunities for making valuable contacts through industry conferences, seminars and training forums. Improved communication within the industry can lead to the identification of issues impacting all industry

[2] SIAST Planning, Research and Development Division. *Saskatchewan Economic and Labour Market Overview 2000.*

participants, such as: factors affecting business growth and training needs for employees.

Both SIAST and Northlands College involve industry stakeholders in Regional Training Needs Assessments. These assessments identify growth sectors, demographics and labour markets within the province. They give employers an opportunity to work with education providers to identify and address training needs. As identified by SIAST: the quality of training available within a community enhances the quality of businesses in that community.

5.0 HUMAN RESOURCE AND TRAINING NEEDS ASSESSMENT OVERVIEW

A survey was drafted by AMEC and reviewed by the Steering Committee. The survey was mailed out to businesses and/ or industries who complete environmental work, or whose activities have an impact on the environment. The survey can be found in Appendix A. Businesses were categorized by location and sector. A total of 184 surveys were mailed out. A response rate of 27.7% was achieved with 51 replies received, as indicated in Table 1 on page 4.

5.1 Business Profile

What is your company's primary line of work? n=51

The introductory question asked respondents to identify the chief activities of their business. The replies were widely varying. Many were different from the original sector classification that was used prior to sending the survey. The responses were as follows:

TABLE 2
Primary Line of Work Including Number of Responses and Location

Primary line of work	# of responses	Location
Aviation services	1	Saskatoon
Construction	3	Buffalo Narrows, La Ronge, Saskatoon,
Construction/fabrication supply	2	Regina, Saskatoon
Consulting engineers	7	Regina, Saskatoon
Contract research and development	1	Regina
Crane rental	1	Saskatoon
Crude oil transportation (pipeline)	1	Regina
Environmental services	1	Saskatoon,
Generation and transmission of electricity	3	Regina,
Habitat conservation	1	Saskatoon
Hazardous waste disposal	1	Regina
Human Resources	2	La Ronge, Regina
HVAC manufacturers	1	Saskatoon
Loans and business plans for Metis Business	2	Saskatoon
Local government	2	Air Ronge
Materials testing	2	Regina, Saskatoon

Mineral exploration	4	La Ronge
Municipality	2	Creighton, Sandy Bay
Outfitting	2	Air Ronge, La Ronge
Printing	1	Saskatoon
Project management	2	Regina
Retail	2	Canoe Narrows, Stanley Mission
Seasonal tourism	2	Canoe Narrows, Saskatoon
Sport fishing	1	La Ronge
Tavern	1	Jan Lake
Trading	1	Saskatoon
Trucking	3	La Ronge, Saskatoon
Wholesale	1	Saskatoon

* Numbers do not equal 51 as businesses may have indicated more than one activity.

Does your business require personnel with environmental expertise either full time, part time, or on a contract basis? n=51

Of the responses, 60.8% (31) replied that they did not require personnel with environmental expertise, 39.2% (20) did require environmental personnel either full time, part time, or on a contract basis. Many organizations that were originally thought to be environmental and identified environmental activities as their primary line of work indicated that they did not require environmental personnel, this may have been due to multitasking of current employees whose main duties are not environmental, or inaccurate categorization in the Saskatchewan Business Directory. These companies did not complete the rest of the survey.

What is the level of aboriginal participation in your business? n=20

Sixty percent (12) of businesses that require environmental personnel have some level of aboriginal participation in their organization, 15% (2) of businesses are 100% aboriginally owned, and hiring of aboriginal subcontractors is done by 15% (2). The percentage of aboriginal employees ranges from less than 1% to 80%. It was indicated that in 50% (6) of businesses employing aboriginal people, aboriginal employees are the majority.

5.2 Workforce Profile

Please indicate the environmental activities your business undertakes, and if known, the number of full time (FT) and/or part time (PT) employees, and/or contractors (C) presently involved (2001), and the number you predict will be involved next year (2002) and in 5 years (2006). n=17 (374 employees)

Some businesses did not indicate numbers. As a result, a total of 374 employees in 2001 were accounted for, these are divided into: 306 full time positions, 36 part time positions and 32 contract positions. In general, not much change is predicted in the workforce profile over the next five years. This may be due to many respondents' inability or unwillingness to forecast into 2002 and 2006.

TABLE 3
2001 Workforce Profile

Environmental Activity	Number of employees		
	Full Time	Part Time	Contract
Water quality testing, water resource management, water pollution abatement, water sampling	25	5	4
Water supply, water treatment	4	3	2
Air quality testing, monitoring, modeling, and air pollution abatement	8	3	2
Land capability and soil contamination, site assessment and clean up/ remediation	13	8	2
Environmental audits, permit compliance, development/monitoring of Environmental Management Systems and policies	91	2	9
Fisheries, wildlife, native plant, or other biological resource assessment or management	102	8.7	6.7
Ecotourism, including such activities as outfitting, guiding, providing accommodations, etc.	2	6	0
Liquid, solid, and hazardous waste management/ collection/ treatment/ disposal	13	0	2
Storage, handling and transportation of dangerous goods	11	0	2
Health & safety, industrial/occupational hygiene	22	0	0
Environmental/Ecological Risk Assessment	15	0	2

For most activities, organizations predicted no change or one to two more full time employees within the next years, and remaining unchanged in the next five years. The number of contract employees is expected to decrease. The decline in contract employees is accompanied by an expected proportional increase in full time employees. The largest expansion is indicated in the area of biological resources with 22% of companies suggesting the hiring of more full time and part time employees, this area is expected to see a 6% increase in positions. The number of positions in the area of water quality are expected to grow by 15% by 2006. Risk assessment activities are also projected to rise by 12% by 2006. The area of ecotourism is expected to remain unchanged, with respect to both business and employee participation. Water quality testing, and land capability were the environmental activities undertaken by most businesses, at 41% and 47%, respectively, 8% of employees participated in water quality testing activities and 6 % in land capability. The greatest number of employees were noted in the areas of environmental assessment (28%) and biological resources (31%). In both of these areas only 29% of respondents to this question indicated their company's involvement.

Approximately how many environmental employees do you have in the following age ranges? n=17 (412 employees)

TABLE 6 Employee Age Ranges	
	Employees
Under 16	0% (0)
16-24	6% (25)
25-34	21% (86)
35-44	20% (84)
45-54	43% (179)
55 and over	9% (38)

A total of 412 employees were accounted for. The difference may be because more respondents indicated actual numbers on this question than the previous. With 43% of employees in the 45 –54 age range, it is clear that the environmental industry may face a shortage soon as more employees reach retirement age.

5.3 Environmental Training

How many of your employees have previous environmental training? n=18

Seventy-two percent (13) of businesses stated that their employees had received previous environmental training, and 50% (9) of businesses had less than ten environmental employees with previous training.

How many employees with environmental training took their environmental training through the following? n=17 (33 employees)

TABLE 5 Previous Training	
	Employees
Co-op	9% (3)
Summer	3% (1)
Job shadowing	9% (3)
Mentorship	6% (2)
Technical College	30% (10)
University	36% (12)
Other	6% (2)

Thirty-three employees with previous environmental training were noted in this question. The majority of businesses reported that their environmental employees received training from universities or technical colleges, with 36% (12) and 30% (10) respectively. The large numbers of employees with diplomas or degrees demonstrates demand for adequate training programs and the need for co-operation among business and training providers. Both co-op and job shadowing were noted as training by 9% of respondents, and 6% stated mentorship and 3% stated summer as previous training for employees. Other responses included classes taken in a technical program offered by the Western Canada Water and Wastewater Association and through correspondence courses.

What type of training does your company support employee participation in? n=18

TABLE 6 Company Support of Training Programs	
	Responses
On the job	89% (16)
Short course	67% (12)
Educational institution	50% (9)
Distance learning	28% (5)
Co-op	17% (3)
Summer	17% (3)
Job shadowing	22% (4)
Mentorship	28% (5)

One organization stated support for all of the above training. 89% (12) of respondents reported on the job training, 67% indicated participation in short courses, while educational institutions and distance education were supported by 67% and 50% of organizations. Support for these types of training indicates that continual training of employees is important to businesses. Both co-op and summer students were supported by 17% of responding organizations, and 22% of businesses participated in job shadowing and 28% took part in mentorship. There were no other training programs noted.

5.4 Training Requirements

What types of environmental employees need more training and what type of training is required? n=17

Additional training was required for all environmental activities. Most types of training suggested were updating of technical knowledge. Training was also mentioned as necessary to be applicable to First Nations, and Northern issues. The handling of wastes and dangerous goods was highlighted as an area where more training is required, and in regards to ecotourism, business startup and hospitality training is needed. Knowledge of regulations in the industry is also essential. A few respondents

indicated the need for short courses to be available in the North. Several others pointed out that their employees are continually trained in order to "keep abreast of current trends, findings and systems". Other training indicated as meeting requirements was: northern people trained on the job.

Do you see a need for environmental employees to have the following qualifications? n=14

TABLE 7
Employee Qualifications

	Certificate	Diploma	Degree	Professional certification (i.e. P. Eng)
Employees	43% (6)	64% (9)	64% (9)	64% (9)

Diplomas, degrees, and professional certification were required by 64% of responding businesses. Positions noted requiring a diploma include: technologists, water sampling, habitat specialists, and conservation officers. A degree was indicated as required for the following activities: environmental studies of air, water and land, environmental analysis, and engineering. This further supports co-operation between business and educational facilities. Professional certification was noted as beneficial for many disciplines, including: habitat professional; geoscientists; and environmental engineers.

Do your environmental personnel require any additional related skills? n=18

TABLE 8
Additional Skills Required

Written	56% (10)
Verbal	44% (8)
Business management	39% (7)
Computer	56% (10)
Project management	56% (10)
WHMIS	44% (8)

CPR	33% (6)
First Aid	39% (7)
Outdoor survival	22% (4)
TDG	33% (6)
Driver's license	61% (13)
Equipment operation	28% (5)

A driver's license was reported as mandatory by 61% (13) of businesses, the main classes of license required were 5 and 1A. Fifty-six percent (56%) (10) of respondents stated written, computer, and project management skills were also necessary. Verbal skills were required by 44% (8) of organizations, while 39% (7) require business management skills. CPR and First Aid skills are required by 33% (6) and 39% (7) of organizations. Outdoor survival skills are necessary for 22% of businesses responding. Transportation of Dangerous Goods is needed by 33% (6), and 28% (5) require equipment operation skills. The equipment listed included sampling and geophysical apparatus, computers, quads, and other vehicles. 44% (8) of businesses require Workplace Hazardous Material Information Systems (WHMIS) training, with one respondent recommending H_2S and Confined Space training as well.

What is the minimum level of education you require when hiring environmental staff? n=15

Organizations require technologists to have post secondary certificates or diplomas. Labourers and assistants need Grade 12 or equivalent. All other positions mentioned, such as: analysts, engineers, supervisors and managers, require a University degree.

5.5 Hiring And Keeping Staff

How do you recruit environmental employees? n=18

61% personal contacts (11)
28% submitted resumes or drop-ins (5)
28% Internet (5)
56% newspaper ads (10)
17% recruitment offices (3)
22% university job boards (4)

The majority (61%) (11) of respondents indicated that recruitment occurs through personal contacts, while 56% (10) recruit through newspaper ads. Resumes or drop-ins and internet were indicated used by 28% (5) of businesses. University job boards were noted as utilized by 22% (4) of organizations and recruitment offices by 17% (3). Other methods of recruitment listed were: word of mouth, and training of existing staff to fit environmental positions. One respondent indicated that much of that company's work was contracted out; therefore they were unlikely to hire any of their own staff.

Have you had any difficulties recruiting environmental employees? n=18

A total of 67% (12) of respondents indicated that they had no difficulties recruiting environmental employees. 33% (6) indicated that they had difficulty recruiting in the following areas: air quality specialists, waterfowl biologists, and agrologists. The difficulties stated are:

- No one wants to move north.
- Demand for experienced personnel is high, most are out of salary range (high) for work experience of applicant.
- Hiring candidates who offer diversity is often difficult; and
- As a First Nation owned and operated company, we strive to employ aboriginal people in all positions. This is often a challenge to acquire technically qualified individuals, but is of great importance to our work.

How can recruitment services better assist you? n=18

A strong majority of 78% (14) of respondents indicated that recruitment services were of no use or little value to their organization. The following responses indicate how recruitment services may be of better assistance to businesses:

- Keep sending us good people!
- Give clear ideas of skills people bring with them, also understand our needs and deliver on those needs.
- By weeding out the applicants with no education (ie. Diploma, degree); and
- Not sure applied to research – probably mostly in areas of attracting people into the field.

Have you had any difficulties keeping environmental employees? n=15

5% (1) yes 95% (14) no

Only one respondent indicated some difficulty retaining employees stating: At times-when we do, it's usually in the North and by the private sector who often pay more. This may indicate demand for skilled environmental professionals is very competitive in the North.

5.6 Sector Workforce

For your business do you:

a) Think there is currently a shortage of skilled environmental workers? n=15

Sixty-seven percent (10) of respondents to this question indicated they did not think that there was a shortage of skilled environmental workers. The 33% (5) who did specified the following areas: air quality, hydrology, assessment and remediation, field and office personnel, certified waterworks employees, and aboriginal employees.

b) Foresee a shortage of skilled environmental workers due to company expansion? n=15

A strong majority of respondents (87%, 13) did not see a shortage due to company expansion. Those who saw a shortage mentioned air quality specialists and hydrologists again, in addition to biologists and wetland engineers.

c) Foresee a shortage of skilled environmental workers due to your company's involvement in new environmental activities? n=17

A shortage was seen by 18% (3) of respondents to this question; one stated the environmental business is growing. The needs for people with skills to enter new areas, and extension or adult learning were mentioned. Assessment, remediation, field and office personnel were again indicated as required.

d) Foresee a shortage of skilled environmental workers due to people leaving the industry? n=16

Only one business felt a shortage due to people leaving the industry. It was attributed to retirement in all environmental occupational fields.

e) Foresee a shortage of skilled environmental workers due to people retiring? n=17

Only two organizations mentioned a lack of workers, due to: some old guides are dying – no replacements; and retirement is occurring in all fields.

Any additional comments on environmental or human resource issues your business may face? n=6

The majority of businesses did not mention any additional issues with regards to human resource or environment. The concerns raised seemed to be specific to each organization. They were:

- Unable to bid on mine activity, not enough experienced personnel on staff. Our company is 100% Northern residents, but lack some of the environmental expertise.
- Our contract company performs mineral exploration services for a public company. All services provided regarding environmental issues would be contracted to a company qualified to handle the work to be done.
- Not having trained personnel in office for specific jobs – may have bring in personnel from other offices.
- Certification has just become mandatory for water treatment plant operators. There is a need for certification training to be made available in Northern Saskatchewan.

6.0 INDUSTRY VALIDATION

A focus group survey, consisting of four pertinent questions, was sent to the Saskatchewan Environment Industry Managers Association (SEIMA) membership through the SEIMA Board. Focus Group Survey responses were separated into three categories of industry, which conduct environmental work in Northern Saskatchewan – Forestry, Mining and Environmental Services.

6.1 Focus Group Survey Questions And Responses

The following table (Table 6.1) presents the focus group survey questions and a summary of the responses from the forestry, mining and environmental services categories of northern industry.

TABLE 9
Focus Group Questions and Response Summary

Question	Forestry	Environmental Services	Mining
1. What types of environmental work is required in northern Saskatchewan?	EIA's.	Aquatic sampling for environmental effects.	EIA's, environmental monitoring & mitigation, landuse & reclamation.
2. What types of environmental training/certification programs are necessary to conduct this environmental work in northern Saskatchewan?	B.Sc. in forestry and/or biology.	Natural resources technicians and B.Sc.+ in aquatic ecology or toxicology.	Minimum B.Sc. in biology, ecology, environmental science or microbiology.
3. Are there adequately trained/certified human resources available in northern Saskatchewan to meet the requirements for northern environmental work, presently and into the future?	No, human resources do not come from the north.	No professionals and limited technicians.	Not now or in the future.
4. Are you able to find and retain qualified personnel to conduct environmental work in northern Saskatchewan, and for what types of work?	Yes, some technicians. More aboriginals are taking technical forestry training.	Yes, but only with in-house training and only for sampling.	No!

6.2 Specific Focus Group Quotes

The following are specific quotes obtained from the focus group survey responses from the different sectors.

Mining -	"There is a major need for training and education."
Forestry -	"Need foresters to meet Environmental Management System Requirements."
	"We hire people with B.Sc. in Forestry and/or Biology. Have not found these qualifications in people from the north."
Environmental - Services	"Most of this environmental work focuses on the aquatic receiving environment."
	"Most environmental work is becoming quite complex, both in terms of study design, field skills, and reporting requirements. To properly conduct environmental work in northern Saskatchewan a study team of varying skill sets is required."
	"Adequately trained/certified human resources from northern Saskatchewan are limited. Only a single applicant from Northern Saskatchewan had the appropriate training for a technical position. No northern residents with appropriate university degrees applied."
	"Only with in-house training can they assist with more complex sampling programs."

7.0 ENVIRONMENTAL TRAINING PROGRAMS DATABASE

Using information obtained in the literature review and from the CCHREI web page databases of Canadian post-secondary educational institutions were compiled. Industry members can use these databases to identify and to obtain information on possible training programs.

7.1 Canadian Post Secondary Educational Institutions

The following table is a database of all post secondary institutions across Canada including the Internet address as a means of obtaining additional information on the institution and its programs.

TABLE 10
Canadian Post Secondary Educational Institutions

Institution	Internet Address
British Columbia	
British Columbia Institute of Technology	www.soe.bcit.bc.ca/soe/co-op
British Columbia Open University	www.ola.bc.ca
Camosun College	www.camosun.bc.ca/camosun.html
Capilano College	www.capcollege.bc.ca
College of New Caledonia	www.cnc.bc.ca
College of the Rockies	www.cotr.bc.ca
Coquitlam College	www.coq-col.bc.ca
Douglas College	www.douglas.bc.ca
Kwantlen University College	www.kwantlen.bc.ca
Langara College	www.langara.bc.ca
Malaspina University College	www.mala.bc.ca
North Island College	www.nic.bc.ca
Northwest Community College	www.nwcc.bc.ca
Okanagan University College	
Selkirk College	www.selkirk.bc.ca
Simon Fraser University	www.sfu.ca
Trinity Western University	www.twu.ca
University of British Columbia	www.ubc.ca
University College of the Cariboo	www.cariboo.bc.ca
University College of the Fraser Valley	www.ucfv.bc.ca
University of Northern British Columbia	www.unbc.edu
University of Victoria	www.uvic.ca
Alberta	
Alberta Vocational College	www.avcedm.ges.ab.ca
Athabasca University	www.athabascau.ca
Augustana University College	www.augustana.ab.ca
The Banff Centre for Management	www.banffmanagement.com
Concordia University College of Alberta	www.concordia.edmonton.ab.ca
Fairview College	fairviewc.ab.ca
Grande Prairie Regional College	www.gprc.ab.ca
Grant MacEwan College	www.gmcc.ab.ca
Lakeland College	www.lakelandc.ab.ca
Mount Royal College	www.mtroyal.ab.ca
Northern Alberta Institute of Technology	webstar.nait.ab.ca
Olds College	www.oldscollege.ab.ca
Red Deer College	www.rdc.ab.ca
The King's University College	www.kingsu.ab.ca
The University of Lethbridge	home.uleth.ca
University of Alberta	web.cs.ualberta.ca/ualberta.html
University of Calgary	www.ucalgary.ca
Saskatchewan	
Northlands College	www.sasked.gov.sk.ca

Prairie West Regional College	www.sasked.gov.sk.ca
Saskatchewan Institute of Applied Science and Technology	www.siast.ca
Saskatchewan Indian Institute of Technologies	
University of Regina	www.uregina.ca
University of Saskatchewan	www.usask.ca
Manitoba	
Brandon University	www.brandonu.ca
Keewatin Community College	www.keewatincc.mb.ca
Red River Community College	www.rrcc.mb.ca
University of Manitoba	www.umanitoba.ca
University of Winnipeg	www.uwinnipeg.ca
Ontario	
Brock University	www.brocku.ca
Canadore College of Applied Arts & Technology	www.canadorec.on.ca
Carleton University	www.carleton.ca
Conestoga College of Applied Arts & Technology	www.conestogac.on.ca
Confederation College of Applied Arts & Technology	spider-web.confederationc.on.ca
Durham College of Applied Arts & Technology	durham.durhamc.on.ca
Erindale College – University of Toronto	www.erin.utoronto.ca
Fanshawe College of Applied Arts & Technology	www.fanshawec.on.ca
Georgian College	www.georcoll.on.ca
Humber College	www.humber.on.ca
Kemptville College	home.istar.ca/~kcat/kcat.htm
La Cite Collegiale – College d'arts appliqués et de technologie	www.lacitec.on.ca
Lakehead University	www.lakeheadu.ca/menu.html
Lambton College of Applied Arts & Technology	www.lambton.on.ca
Laurentian University of Sudbury	www.laurentian.ca
Loyalist College of Applied Arts & Technology	www.loyalistc.on.ca
Mohawk College of Applied Arts & Technology	www.mohawk.on.ca
Niagara College of Applied Arts & Technology	www.niagarac.on.ca
Nipissing University	www.unipissing.ca/nip.htm
Northern College of Applied Arts & Technology	www.northernc.on.ca/norcol.html
Ridgetown College	www.ridgetownc.on.ca
Ryerson Polytechnic University	www.acs.ryerson.ca
Sault College of Applied Arts & Technology	www.saultc.on.ca
Seneca College of Applied Arts &	www.sencac.on.ca

Technology	
Sheridan College of Applied Arts & Technology	www.shericac.on.ca
Sir Sandford Fleming College	www.flemingc.on.ca
St. Lawrence College	www.stlawrencec.on.ca
Trent University	www.trentu.ca
University of Guelph	www.uoguelph.ca
University of Ottawa	www.uottawa.ca
University of Toronto	www.utoronto.ca/uoft.html
University of Toronto at Scarborough	www.scar.utoronto.ca
University of Waterloo	www.uwaterloo.ca
University of Windsor	www.uwindsor.ca
York University	www.yorku.ca
Quebec	
Bishop's University	www.ubishops.ca
Cegep de Jonquiere	www.cjonquiere.qc.ca
Cegep de Saint-Laurent	www.cegep-st-laurent.qc.ca
Cegep de Ste-Foy	www.cegep-ste-foy.qc.ca
Cegep de Trois-Rivieres	www.cegeptr.qc.ca
Cegep Joliette – De Lanaudiere	www.collanaud.qc.ca
Cegep – Vanier College	www.vaniercollege.qc.ca
Concordia University	www.concordia.ca
Dawson College	www.dawsoncollege.qc.ca
Ecole de Technologie Superieure	www.etsmtl.ca
Ecole Nationale d'Administration Publique	www.uquebec.ca/enap
McGill University	www.mcgill.ca
Tele-universite	www.teluq.uquebec.ca
Universite de Montreal	www.umontreal.ca
Universite de Sherbrooke	www.usherb.ca
Universite du Quebec	www.teluq.uquebec.ca
Universite du Quebec a Chicoutimi	www.uqac.uquebec.ca
Universite du Quebec a Hull	www.uqah.uquebec.ca
Universite du Quebec a Montreal	www.uqam.ca
Universite du Quebec a Rimouski	www.uqar.uquebec.ca
Universite du Quebec a Trois-Rivieres	www.uqtr.uquebec.ca
Universite du Quebec en Abitibi-Tescamingue	www.quat.uquebec.ca
Universite Laval	www.rsvs.ulaval.ca
Universite Sainte-Anne	www.isisnet.com/ustanne
Atlantic Provinces	
Dalhousie University	www.dal.ca
Holland College	www.hollandc.pe.ca
Memorial University of Newfoundland	www.mun.ca
Mount Allison University	www.mta.ca
Mount Saint Vincent University	www.msvu.ca
Nova Scotia Agricultural College	www.nsac.ns.ca
Saint Francis Xavier University	www.stfx.ca
Technical University of Nova Scotia	www.tuns.ca
Universite de Moncton	www.umoncton.ca

University College of Cape Breton	eagle.uccb.ns.ca
University of New Brunswick	www.unb.ca

7.2 Environmental Programs In Western Canadian Post Secondary Educational Institutions

Using information obtained from post secondary educational institutions in Canada, databases of environmental programs offered within the Western Provinces were compiled. Each includes a list of the environmental programs offered at the particular institution, as well as contact information.

7.2.1 Saskatchewan

TABLE 11
Post Secondary Environmental Programs Offered in Saskatchewan

Educational Institution	Contact Information	Environmental Programs
Northlands College	Box 509 LaRonge, SK S0J 1L0 306-425-4353 1-888-311-1185 Fax 306-425-2696 www.sasked.gov.sk.ca/reg_col/northlands	Forest Ecosystem Technology Radiation Environmental Monitoring
Prairie West Regional College	514 Main Street, Box 488 Kindersley, SK S0L 1S0 306-463-6431 www.sasked.gov.sk.ca/reg_col/prairie_west	Agriculture Geography
Saskatchewan Indian Institute of Technologies	100-103A Packham Avenue Saskatoon, SK S7N 4K4 306-244-4444 Fax 306-244-1391	Geographical Information Systems Integrated Land Management
Saskatchewan Institute of Applied Science and Technology	Woodland Campus 1100 – 15th Street E, Box 3003 Prince Albert, SK S6V 6G1 306-953-7000 1-800-667-9664 www.siast.sk.ca	Ecotourism Forest Ecosystems Technology Geographic Information Systems for Resource Management Applications Integrated Resource Management
	Palliser Campus Box 1420 Moos Jaw, SK S6H 4R4 306-694-3200 1-800-667-0055 www.siast.sk.ca	Computer Aided Design and Drafting Technology Environmental Engineering Technology Geomatics Technology Water Resources Engineering Technology Water & Wastewater Technician

	Kelsey Campus Idylwyld and 33rd Street, Box 1520 Saskatoon, SK S7K 3R5 306-933-6350 1-800-567-3263 www.siast.sk.ca	Biotechnology CAD/CAM Engineering Technology Chemical Technology
University of Regina	Regina, SK S4S 0A2 306-585-4591 Fax 306-585-5203 admissions.office@uregina.ca www.uregina.ca	Biology Biochemistry Chemistry Environmental Health and Science Program Environmental Systems Engineering Geography Geology
University of Saskatchewan	105 Administration Place Saskatoon, SK S7N 5A2 306-966-6766 registrar@usask.ca www.usask.ca/registrar	Agriculture and Bioresource Engineering Biochemistry Biology Chemistry Civil Engineering Environmental Earth Sciences Environmental Science Geography Geology Geophysics Geological Engineering Land Use and Environmental Studies Plant Ecology Rangeland Resources Regional and Urban Development Soil Science

7.2.2 British Columbia

TABLE 12
Post Secondary Environmental Programs Offered in BC

Educational Institution	Contact Information	Environmental Programs
British Columbia Institute of Technology	3700 Willingdon Avenue Burnaby, BC V5G 3H2 604-434-5734	Mining Technology Renewable Resources
British Columbia Open University	Box 82080 Burnaby, BC V5C 6J8 604-431-3300	Agriculture Biology Chemistry

	1-800-663-9711 Fax 604-431-3444 www.ola.bc.ca student@ola.bc.ca	Environmental and Earth Sciences Geography Geology Tourism Management
Camosun College	3100 Foul Bay Road Victoria, BC V8P 5J2 250-370-3000 Fax 250-370-3551	Biology Chemistry Applied Chemistry and Biochemistry
	4461 Interurban Road Victoria, BC V9E 2C1 250-370-3000 Fax 250-370-3750	Environmental Technology
Capilano College	2055 Purcell Way North Vancouver, BC V7J 3H5 604-986-1911 Fax 604-984-4985	Biology Chemistry Geology Geography
College of New Caledonia	250-561-5830 Fax 250-561-5866 www.cnc.bc.ca mcvey@cnc.bc.ca	Geographic Information Systems Technology
College of the Rockies	2700 College Way, Box 8500 Cranbrook, BC V1C 5L7 250-489-2751 Fax 250-489-1790 www.cotr.bc.ca	Adventure Tourism Ecotourism & Adventure Travel Environmental Studies
Coquitlam College	516 Brookmere Avenue Coquitlam, BC V3J 1W9 604-939-6633 Fax 604-939-0336 admiss@coq-col.bc.ca www.coq-col.bc.ca	Biology Chemistry Geography
Douglas College	PO Box 2503 New Westminster, BC V3L 5B2 604-527-5400 Fax 604-527-5095 www.douglas.bc.ca	Biology Chemistry Environmental Science Geography Geology
Kwantlen University College	12666 - 72nd Avenue Surrey, BC V3W 2M8 604-599-2100 Fax 604-599-2068 inquiry@kwantlen.bc.ca	Applied Science Science Associate of Science Diploma in Science Environmental Protection Technology
Langara College	100 West 49th Avenue Vancouver, BC V5Y 2Z6 604-323-5511 geninfo@langara.bc.ca	Environmental Studies Geography Chemistry Ecology General Biology

		Microbiology/Molecular Biology
Malaspina University College	900 – 5th Street Nanaimo, BC V9R 5S5 250-753-3245 advising@mala.bc.ca www.mala.bc.ca	Biology Chemistry Earth Science
North Island College	2300 Ryan Road Courtenay, BC V9N 8N6 1 800 715 0914 www.nic.bc.ca	Aquaculture & Fisheries Environmental Studies Environmental Assessment Tourism
Northwest Community College	3966 2nd Avenue P.O. Box 3606 Smithers, BC V0J 2N0 250-847-4461 Fax 250-847-4568 www.nwcc.bc.ca	Coastal Eco-Adventure Tourism Natural Resources Northwest Field School
Okanagan University College	3333 College Way Kelowna, BC V1V 1V7 250-762-5445	Bachelor of Science
Selkirk College	301 Frank Beinder Way Box 1200 Castlegar, BC V1N 3J1 250-365-7292 Fax 250-365-6568 www.selkirk.bc.ca	Integrated Environmental Planning Technology Recreation, Fish and Wildlife Technology
Simon Fraser University	8888 University Drive Burnaby, BC V5A 1S6 604-291-3111 www.sfu.ca undergraduate-admissions@sfu.ca	Biology Chemistry Earth Sciences Environmental Sciences Geography Resource and Enviro. Management
Trinity Western University	7600 Glover Road Langley, BC V2Y 1Y1 604-513-2070 Fax 604-513-2096 admissions@twu.ca www.twu.ca	Biology Chemistry Environmental Studies Natural and Applied Sciences
University College of the Cariboo	900 McGill Road Box 3010 Kamloops, BC V2C 5N3 250-828-5000 Fax 250-828-5086	Environmental Studies

University College of the Fraser Valley	33844 King Rd Abbotsford, BC V2S 7M8 604-504-7441 reginfo@ucfv.bc.ca www.ucfv.bc.ca	Biology Chemistry Geography Computer Assisted Drafting Agriculture Technology Integrated Pest Management
University of British Columbia	2016 - 1874 East Mall Vancouver, BC V6T 1Z1 604-822-3014 Fax 604-822-3599 admissions.inquiries@ubc.ca www.ubc.ca	Biochemistry Botany Chemistry Chemical and Bioresource Engineering Civil Engineering Earth and Ocean Sciences Environmental Sciences Forest Resources Management Forest Sciences Geography Mining and Mineral Process Engineering
University of Northern British Columbia	3333 University Way Prince George, BC V2N 4Z9 1-888-419-5588 registrar-info@unbc.ca www.unbc.ca	Bachelor of Science Biology Chemistry Environmental Science Environmental Studies Forestry Geography Natural Resources Management Northern Studies Resource Based Tourism Resource Recreation Wildlife and Fisheries Traditional Environmental Knowledge
University of Victoria	PO Box 1700 STN CSC, Victoria, BC V8W 2Y2 250-721-7211 www.uvic.ca	Biology Chemistry Earth and Ocean Sciences Environmental Health Forest Biology Geography

7.2.3 Alberta

TABLE 13
Post Secondary Environmental Programs Offered in Alberta

Educational Institution	Contact Information	Environmental Programs
Athabasca University	1 University Drive Athabasca, AB T9S 3A3 780-675-6111 1-800-788-9041 Fax 780-675-6437 auinfo@athabascau.ca www.athabascau.ca	Bachelor of Science
Augustana University College	4901 – 46 Avenue Camrose, AB T4V 2R3 780-679-1132 1-800-661-8714 Fax 780-679-1129 admissions@augustana.ab.ca www.augustana.ab.ca	Architecture/Environmental Design Biology Chemistry Environmental Studies Geography
The Banff Centre for Management	Box 1020, Station 45 Banff, AB T0L 0C0 1-800-590-9799 Fax 403-762-6422 leadership@banffcentre.ca www.banffmanagement.com	Environmental Leadership
Fairview College	11235 – 98 Avenue Box 3000 Fairview, AB T0H 1L0 1-888-999-7882 www.fairview.ab.ca	Agricultural Technology
Grande Prairie Regional College	10726 – 106 Avenue Grande Prairie, AB T8V 4C4 780-539-2944 1-888-539-GPRC Fax 780-539-2888 www.gprc.ab.ca	Bachelor of Applied Forest Resource Management
Grant MacEwan College	10700 – 104 Avenue Edmonton, AB T5J 4S2 780-497-5140	Atmospheric Sciences Biochemistry Environmental Earth Sciences Environmental Physical Sciences Geophysics
Lakeland College	5707 – 47 Avenue West Vermillion, AB T9X 1K5 780-853-8420 Fax 780-853-2955 admissions@lakelandc.ab.ca www.lakelandc.ab.ca	Adventure Tourism and Outdoor Recreation Applied Integrated Environmental Conservation and Reclamation Environmental Management Environmental Monitoring and

		Compliance Natural Resources Technology
Mount Royal College	4825 Richard Road SW Calgary, AB T3E 6K6 403-240-0148 Fax 403-240-6740 admissions@mtroyal.ab.ca www.mtroyal.ab.ca	Applied Ecotourism and Outdoor Leadership Applied Industrial Ecology Environmental Technology
Northern Alberta Institute of Technology	11762 – 106 Street NW Suite 1000 Edmonton, AB T5G 3H1 780-471-6248 1-800-661-4077 Fax 780-471-8490 registrar@nait.ab.ca www.nait.ab.ca	Biological Sciences Technology Chemical Technology Forest Technology Geological Technology Geomatics Engineering Technology Hydrogeological Technology Renewable Resources Program Water and Wastewater Technician
Olds College	4500 – 50 Street Olds, AB T4H 1R6 403-556-8281 1-800-661-6537 info@admin.oldscollege.ab.ca www.oldscollege.ab.ca	Integrated Environmental Management Land Information Systems Land Resource Management
Red Deer College	P.O. Box 5005 56 Avenue & 32 Street Red Deer, AB T4N 5H5 403-342-3300 Fax 403-340-8940 www.rdc.ab.ca	Agriculture Atmospheric Sciences/ Environmental Earth Sciences Biochemistry Biology Chemistry Environmental and Conservation Sciences Forest Business Management Forestry
The King's University College	9125 50 Street Edmonton, AB T6B 2H3 1-800-661-TKUC(8582) 780-465-3500 Fax 780-465-3534 www.kingsu.ab.ca	Biology Chemistry Environmental Studies
University of Alberta	Office of the Registrar and Student Awards Administration Building University of Alberta Edmonton, AB T6G 2E2 780-492-3113	Agriculture Biochemistry Biological Sciences Chemical Engineering Chemistry Civil Engineering

	www.ualberta.ca	Environmental and Conservation Sciences Earth and Atmospheric Sciences Environmental Physical Sciences Forest Business Management Forestry Geophysics Northern Studies
University of Calgary	2500 University Drive NW Calgary, AB T2N 1N4 403-220-6645 applinfo@ucalgary.ca www.ucalgary.ca	Biological Sciences Chemistry Earth Science Environmental Design Environmental Science Geology and Geophysics Geography Industrial Design Planning
University of Lethbridge	4401 University Drive Lethbridge, AB T1K 3M4 403-320-5700 Fax 403-329-5159 Inquiries@uleth.ca home.uleth.ca	Agricultural Biotechnology Agricultural Sciences Biology Chemistry Environmental Science Geography Geographic Information Systems

7.2.4 Manitoba

TABLE 14
Post Secondary Environmental Programs Offered in Manitoba

Educational Institution	Contact Information	Environmental Programs
Brandon University	Brandon, MB R7A 6A9 204-728-9520 Fax 204-726-4573 www.brandonu.ca	Botany Chemistry Geography Geology
Keewatin Community College	Box 3000 The Pas, MB R9A 1M7 504 Princeton Drive Thompson, MB R8N 0A5 1-800-238-8508 admissions@keewatincc.mb.ca www.keewatincc.mb.ca	Chemical Engineering Technology Ecotourism Natural Resources Management Technology
Red River College	2055 Notre Dame Avenue Winnipeg, MB R3H 0J9 1-888-515-7722	Applied Biology Applied Chemistry Applied Environmental Studies

		CAD Technology Chemical and Biosciences Technology Civil Technology GIS Technology
University of Manitoba	424 University Centre Winnipeg, MB. R3T 2N2 204-474-8808 Fax 204-474-7554 www.umanitoba.ca admissions@umanitoba.ca	Biology Biosystems Engineering Botany Chemistry Civil and Geological Engineering Delta Marsh Field Station Ecology Environmental Design Environmental Science Geography Geological Sciences Plant Science Soils Science
University of Winnipeg	515 Portage Avenue Winnipeg, MB R3B 2E9 204-786-9159 Fax 204-786-8656 admissions@uwinnipeg.ca www.uwinnipeg.ca	Biology Chemistry Environmental Chemical Analysis Environmental Studies Forest Ecology Forest Policy and Management Geography Global Environmental Systems

7.3 Details Of Environmental Programs At Saskatchewan Post Secondary Educational Institutions

This section provides a summary of each environmental program in Saskatchewan including the length, type of accreditation, a brief overview, any options or specializations available, and the type of certification applicable. Additional information may be found in each college calendar or by contacting the institution with the information provided.

7.3.1 Northlands College

Box 509
LaRonge, SK S0J 1L0
306-425-4353 1-888-311-1185
Fax 306-425-2696
www.sasked.gov.sk.ca/reg_col/northlands

Radiation Environmental Monitoring Program

Length:	13 months Co-op
Achievement:	Certificate
Overview:	Includes chemistry, math, technical communications, geology, environmental science, industrial safety, introduction to the mining industry, and computers.

Forest Ecosystem Technology *(Woodlands Campus extension course offered in 2001)*

Length:	76 weeks
Achievement:	Diploma
Overview:	The program has been designed with broad forest sector input to prepare students for employment in a variety of technical roles including ecological assessment, forest planning, management, health & protection, development & renewal, field supervision, etc.

7.3.2 Prairie West Regional College

514 Main Street, Box 488
Kindersley, SK S0L 1S0
306-463-6431
www.sasked.gov.sk.ca/reg_col/prairie_west

Prairie West Regional College works co-operatively with the University of Saskatchewan to deliver university courses by traditional and non-traditional methods. A first year Arts & Science program is available at the site in Kindersley.

Environmental Programs offered: ***Agriculture***
Geography

7.3.3 Saskatchewan Indian Institute Of Technologies

100-103A Packham Avenue
Saskatoon, SK S7N 4K4
306-244-4444
Fax 306-244-1391

Geographical Information Systems (GIS)

Length:	40 weeks
Achievement:	Certificate
Overview:	Program provides basic training in the theory and concepts of GIS plus hands-on skill development in the operation of GIS technologies.

Integrated Land Management

Length:	40 weeks
Achievement:	Certificate
Accreditation:	Certification for INAC Land Management Training Program classes

Overview: Students gain skills to perform: record keeping, land transactions, implementation and enforcement of land related policies and practices, and map interpretation.

7.3.4 Saskatchewan Institute Of Applied Science And Technology

Woodland Campus

1100 – 15th Street E, Box 3003
Prince Albert, SK S6V 6G1
306-953-7001 1-800-667-9664
www.siast.sk.ca

Ecotourism
Length: 24 weeks
Achievement: Certificate
Overview: Graduates are prepared to be Ecotourism entrepreneurs, and help others gain a better appreciation for the natural and cultural environment by providing a tourism experience that is environmentally sustainable and culturally sensitive.

Forest Ecosystems Technology
Length: 27 months
Achievement: Diploma
Overview: Students are provided with the knowledge, skills, and extensive field training in forestry to meet the challenges of ecosystem based forest management and protection.

Geographic Information Systems (GIS) for Resource Management Applications
Length: 28 weeks
Achievement: Certificate
Overview: Program provides training to develop computer-based GIS knowledge and skills, and provides employment experiences related to resources and ecosystem management. Skills gained in remote sensing, map design, and Global Positioning Systems (GPS).

Integrated Resource Management
Length: 80 weeks
Achievement: Diploma
Overview: Students develop specialized skills with Global Positioning Systems (GPS) and Geographical Information Systems (GIS) along with developing general competency with standard computer uses and applications.
Specializations: Fisheries
Forestry
Parks Management
Wildlife
Option: University of Regina/SIAST Joint B.Sc. Program in Environmental Biology

Palliser Campus

Box 1420
Moose Jaw, SK S6H 4R4
306-694-3201 1-800-667-0055
www.siast.sk.ca

Civil Engineering Technology

Length:	31 months Co-op
Achievement:	Diploma
Accreditation:	Will meet requirements for accreditation set by: Saskatchewan Applied Science Technologists and Technicians (SASTT) Canadian Technology Accreditation Board Canadian Council of Technicians and Technologists
Overview:	Students are trained in a broad base of engineering technology services – surveying, drafting, computer, applications and modeling, soil, concrete, and asphalt testing, concrete and asphalt design, hydraulics, structural, geotechnical, transportation, construction engineering, municipal infrastructure, and project management.

Computer Aided Design and Drafting Technology

Length:	31 months Co-op
Achievement:	Diploma
Overview:	Students provided with the skills and knowledge needed to perform computerized design and drafting functions in an industrial or engineering setting.

Environmental Engineering Technology

Length:	27 months Co-op
Achievement:	Diploma
Accreditation:	Will meet requirements for accreditation set by: Saskatchewan Applied Science Technologists and Technicians (SASTT) Canadian Technology Accreditation Board Canadian Council of Technicians and Technologists
Overview:	Students are trained to apply science and engineering principles to traditional engineering practices to minimize adverse human effects on the environment.

Geomatics Technology

Length:	31 months Co-op
Achievement:	Diploma
Accreditation:	Graduates will be eligible for membership in SASTT as Applied Science Technologists after 2 years of suitable industrial experience.
Overview:	Geomatics is the acquisition, storage, manipulation, analysis and display of geographically referenced data. Graduates may work in

consulting, government, and surveying firms within the resource sector.

Water Resources Engineering Technology

Length: 27 months
Co-op
Achievement: Diploma
Accreditation: Canadian Technology Accreditation Board
Canadian Council of Technicians and Technologists
After 2 years experience, eligible for SASTT membership
Overview: Training in: surveying, drafting, computer applications and modeling, soil and concrete testing, water chemistry, hydraulics, surface and ground water hydrology, atmospheric and hydrometric data collection and analysis, irrigation, water and wastewater treatment, river engineering, municipal infrastructure, environmental engineering and project management.

Water & Wastewater Technician

Length: Usually completed within 5 years
Distance education
Achievement: Certificate
Overview: Students are trained to operate and maintain public and private water treatment plants, water distribution systems, wastewater treatment plants, and wastewater collection systems.

Kelsey Campus

Idylwyld and 33rd Street, Box 1520
Saskatoon, SK S7K 3R5
306-933-6351 1-800-567-3263
www.siast.sk.ca

Biotechnology

Length: 2 years
Achievement: Diploma
Overview: Trains students in scientific principles and analytical practices used in the biological, biochemical, biomedical, biotechnical, and related fields.

CAD/CAM Engineering Technology

Length: 2 years
Achievement: Diploma
Accreditation: Canadian Technology Accreditation Board
Canadian Council of Technicians and Technologists
After 2 years experience, eligible for SASTT membership
Overview: Graduate technologists have an understanding of engineering design and analysis principles in fields where CAD/CAM is used most and have enough computer knowledge to operate and provide technical assistance in management of CAD/CAM systems.

Chemical Technology

Length:	2 years
Achievement:	Diploma
Overview:	Students gain skills needed to conduct experiments, record, process and report data, assess quality, communicate results, construct equipment, service and maintain scientific instruments, handle and manipulate chemicals.
Option:	University of Regina/SIAST Joint B.Sc. Program in Chemical Technology.

7.3.5 University Of Regina

Regina, SK S4S 0A2
306-585-4591
Fax 306-585-5203
admissions.office@uregina.ca
www.uregina.ca

Biology

Length:	3 years 4 years
Achievement:	Bachelor of Science Honours
Overview:	May combine major with biochemistry, geography, or statistics.
Option:	University of Regina/SIAST Joint B.Sc. Program in Environmental Biology

Biochemistry
Chemistry

Length	3 years 4 years
Achievement:	Bachelor of Science Honours
Overview:	May combine majors: biochemistry/biology or biochemistry/ chemistry.
Option:	University of Regina/SIAST Joint B.Sc. Program in Chemical Technology.

Environmental Health and Science Program
Saskatchewan Indian Federated College

Length:	4 years
Achievement:	Bachelor of Applied Science
Overview:	Offered through a partnership with the Saskatchewan Indian Federated College Department of Science and University of Regina Environmental Systems Engineering. Professional development occurs through practical hands on experience. There is acceptance, promotion and incorporation of First Nations philosophies.

Environmental Systems Engineering

Length:	4 years Co-op
Achievement:	Bachelor of Applied Science
Accreditation:	Canadian Engineering Accreditation Board
Overview:	Studies in water resource systems, regional infrastructure systems, waste management, and air pollution control.

Geography

Length:	3 years 4 years
Achievement:	Bachelor of Arts Bachelor of Science Honours
Accreditation:	Graduates with a B.Sc. may apply to the Association of Professional Engineers and Geoscientists of Saskatchewan for registration as a Professional Geoscientist.
Overview:	May combine major with economics or biology.

Geology

Length:	3 years 4 years
Achievement:	Bachelor of Science Honours
Accreditation:	Graduates may apply for membership with the Association of Professional Engineers and Geoscientists of Saskatchewan.
Overview:	

7.3.6 University Of Saskatchewan

105 Administration Place
Saskatoon, SK S7N 5A2
306-966-6766
registrar@usask.ca
www.usask.ca/registrar

Agriculture and Bioresource Engineering

Length:	4 years
Achievement:	Bachelor of Applied Science
Overview:	Integrates engineering science and design and applied biological sciences for the solution of problems involving plants, animals and the natural environment.

Biochemistry

Length:	3 years 4 years
Achievement:	Bachelor of Science Honours
Overview:	Education and training in the molecular approach to the study of life sciences.

Biology

Length:	3 years 4 years
Achievement:	Bachelor of Science Honours
Overview:	
Option:	May also major in Agricultural Biology.

Chemistry

Length:	3 years 4 years
Achievement:	Bachelor of Science Honours
Overview:	Deals with the structure and transformations of material substances. May specialize in: analytical, bioinorganic, bioorganic, computational, inorganic, organic, physical, and theoretical chemistry.

Civil Engineering

Length:	4 years
Achievement:	Bachelor of Applied Science
Overview:	Covers broad areas of environmental, geoenvironmental, hydrology, hydrotechnical structures, materials and transportation engineering.

Environmental Earth Sciences

Length:	4 years
Achievement:	Bachelor of Science Honours
Overview:	A joint program of the departments of Geography, Geological Sciences, and Soil Science. It explores the relationships among the solid Earth, the atmosphere, the oceans, and the biosphere; its primary emphasis is on the physical sciences.

Environmental Science

Length:	4 years Co-op
Achievement:	Bachelor of Science in Agriculture
Overview:	Provides an understanding of the relationships between environmental constraints and sustainable development with an emphasis on prairie agriculture.

Geography

Length:	3 years 4 years Co-op
Achievement:	Bachelor of Arts Bachelor of Science Honours
Overview:	Two themes: physical and human geography.

Option: Four minors: human, physical, urban planning and Geographical Information Systems.

Geology
Geophysics

Length: 3 years
4 years

Achievement: Bachelor of Science
Honours

Accreditation: Graduates may register as Professional Geoscientists in the province of Saskatchewan.

Overview:

Geological Engineering

Length: 4 years

Achievement: Bachelor of Applied Science

Overview: Designed for those interested in the exploration, development, recovery, and stewardship of subsurface resources. A broad background in aspects of geotechnical, mining and petroleum engineering is provided.

Land Use and Environmental Studies

Length: 4 years
Co-op

Achievement: Bachelor of Arts
Bachelor of Science
Honours

Overview:

Option: May major in Land Use and Environmental Studies, or complete a major in biology, economics, geography, or sociology, while fulfilling the requirements of this program.

Plant Ecology

Length: 4 years

Achievement: Bachelor of Science in Agriculture

Overview:

Rangeland Resources

Length: 4 years

Achievement: Bachelor of Science in Agriculture

Overview:

Regional and Urban Development

Length: 4 years
Co-op

Achievement: Bachelor of Arts
Honours

Overview: Designed to acquaint the student with the organization and functioning of cities and regions.

Option: Three specialty tracks: Community Development, Physical Environment, or Modeling and Analysis.

Soil Science
Length: 4 years
Achievement: Bachelor of Science in Agriculture
Overview: Provides an in depth understanding of the physical, biological and chemical processes that occur in the soil and the role of soils in plant production and environmental management.

8.0 KEY FINDINGS

Businesses that fall under the definition of the environment industry in Northern Saskatchewan are involved in traditional natural resource fields as well as research and development seeking solutions to local problems. These include:

- resource management,
- environmental impact assessment and mitigation,
- conservation,
- waste management,
- remediation,
- reclamation,
- aesthetics,
- transportation, storage, and disposal of dangerous good,
- air, water, soil, and noise pollution control; and
- regulation, monitoring, and compliance.

The environmental industry is a multidisciplinary one employing: chemists, engineers, biologists, geographers, geologists, agrologists, planners, technologists, and people with backgrounds in environmental studies, business administration, health and safety, computer programming, and humanities. There is a need for employees with a wide range of skills due to the prevalence of small businesses in the industry by and the broad spectrum of activities performed by these companies. The workforce is one of highly skilled people, who need to have a broad base of skills. Employees must have business management and communication skills in order maintain a small business. This will become even more necessary as the number of contractors is expected to decrease in future years, accompanied by an expected proportional increase in full time employees.

In general, the environmental industry is characterized as an emerging sector, dominated by small to medium enterprises. The sector is constantly changing, with new legislation and regulations being introduced as awareness increases. The development of technology is a rapidly evolving area. As a result of this constant change, small, under-capitalized companies may find it increasingly difficult to develop and enhance their business. As the industry expands, it is important for small businesses to network. By sharing ideas and funding for training, businesses can make their needs heard by educational facilities. The majority of businesses reported that their environmental employees received training from universities or technical colleges, with 36% and 30% respectively. 89% of respondents reported on the job training. Meeting these requirements warrants cooperation between industry and educational facilities.

A broad understanding of the environmental industry in Saskatchewan suggests that it is expanding. On the part of industry, there is a reluctance to forecast past one year. For northern Saskatchewan, this may lead to a shortage of qualified employees, as industry may be ill prepared. This is especially true as most employees are in the 45 – 54 age range and nearing retirement, other employees are needed to take their place. As well, there is a projected decline in contract employees.

According to the Focus Group responses:

- "there is a major need for (environmental) training and education."
- "most environmental work is becoming quite complex."
- "adequately trained/certified human resources from northern Saskatchewan are limited."

In northern Saskatchewan, 60% of businesses that require environmental personnel have some level of aboriginal participation in their organization, and 15% of businesses are 100% aboriginally owned. Of businesses employing aboriginals, 40% have a majority of aboriginal employees. The mean age of the aboriginal population in Saskatchewan is much younger than that of the rest of the province; there is a need to train these people, as they will be an important part of the workforce. In addition, training needs to address the specific needs and issues of First Nations, and Northerners.

The greatest number of environmental employees in northern Saskatchewan was noted in the areas of environmental assessment (28%) and biological resources (31%). The largest expansion is indicated in the area of biological resources with 22% of companies suggesting the hiring of more full time and part time employees; this area is expected to see a 6% increase in positions. This may lead to an increased demand for bioresource programs such as: Forest Ecosystem Technology, Integrated Resource Management, Agriculture and Bioresource Engineering, and Biology.

The handling of wastes and dangerous goods was highlighted as an area where more training is required. Training is needed in regards to ecotourism, business startup and hospitality. Knowledge of regulations in the industry is also essential. A few respondents indicated the need for short courses to be available in the North. Several others pointed out that their employees are continually trained in order to "keep abreast of current trends, findings and systems". The best training method for the northern environmental industry may be continuing education in the form of short courses offered on location. An important point made by one respondent is: "Certification has just become mandatory for water treatment plant operators. There is a need for certification training to be made available in Northern Saskatchewan". Certification is not required for Class 2 and lower facilities, which are common in smaller communities. Recognition of experience in-lieu of education is accepted for entrance into a certification program, although, additional training may be required in order to pass the certification exams.

There are 46 educational institutions in Western Canada offering environmental training, with 42 undergraduate or equivalent environmental programs offered at six facilities in Saskatchewan, as shown in Table 10. In order to meet human resource needs in the north, training programs need to incorporate specific northern and aboriginal issues. To improve qualifications of northern employees, training programs need to be offered directly in the north and in cooperation with business. This may increase the number of

educated people working and staying in the north. It will also improve the economic base of the area, as the quality of business will improve with the employees.

9.0 RECOMMENDATIONS

The following recommendations are based on the results of the research and developed in consultation with the Steering Committee.

1. Communication

The results of the human resource and training needs assessment and the recommendations of the Steering Committee should be publicized. The executive summary could be forwarded to stakeholders, both business and educational, with the complete report being made available to those requesting it. Presentation of the report should be made to SEIMA, and information sent to CCHREI.

2. Demographics

The data compiled in the human resource and training needs assessment requires further analysis on a provincial level. More detailed, and province wide data should be obtained. A demographer or statistician with provincial knowledge should be utilized.

3. Sustainability

A course of action must be developed in order to ensure that the process started by the Northern Saskatchewan Environment Industry Sector Partnership Steering Committee continues. The Steering Committee should continue to work together to identify and address human resource and training issues. Additional industry and educational stakeholders should be included in this process and SEIMA and CCHREI may provide further direction and support.

4. Aboriginal Strategies

The industry needs to develop and enhance a partnership with aboriginal educational facilities, to promote training and career opportunities within the sector. For example, organizations such as the Aboriginal Relations Office, which establishes Aboriginal Human Resource Development Agreements (AHRDA) in support of skills development and employment initiatives.

5. Partnerships

Partnerships within the industry need to be improved. Small companies must network amongst themselves to share ideas and funding. Co-operation between business and training providers can improve educational programs and employability. The Steering Committee should expand to include additional stakeholders. Northern and aboriginal groups should be involved in order to address the specific needs of the North, and to collaborate on a provincial level.

6. Awareness

The educational system needs to recognize career opportunities within the environment industry. Career counselors must be provided with information so thy can guide interested students toward this field. Businesses need to become more educated on the types of training programs offered that can provide them with qualified candidates for employment, as well as continuing training for current employees.

7. Skill Shortages

Potential shortages of employees are identified in the following three management areas: waste, water, and biological resource management. Industry needs to identify the necessary skills in these areas and communicate these needs to educational institutions, which should address these priority training needs.

10.0 NEXT STEPS

In order to ensure that the work begun under the Sector Partnership initiative is continued, the committee has identified the following first steps:

1. Develop a communication strategy by circulating this document to key stakeholders and encouraging a dialogue among them in regards to the issues raised.

2. Enhance partnerships with organizations, such as: Post-Secondary Education and Skills Training; Human Resources Development Canada; and the Aboriginal Relations Office, to explore assistance and funding support for the proposed strategy and implementation of recommendations.

3. Enhance partnerships with SEIMA and CCHREI in order to develop and implement new and ongoing strategies and recommendations specific to the environmental industry, as well as identifying options for industry-driven funding for training.

4. Expand and strengthen the Environmental Industry Sector Partnership for the continuation and sustainability of long term human resource planning.

5. In partnership with training providers, develop skill sets required by industry in order to identify gaps and develop strategies to address the gaps.

6. Industry and stakeholders need to work together to develop and implement recruitment strategies to promote educational and career opportunities to encourage youth and aboriginal persons to enter this industry.

BIBLIOGRAPHY

Canadian Council for Human Resources in the Environment Industry. 2000. Human Resources in the Canadian Environmental Sectors: Final Report.

Calibre Consultants. 1999. SIAST Regional Training Needs Assessment 1999.

CETAC – West. 1997. A Survey of the Environment Industry in Saskatchewan.

Northlands College. 2000. Northern Saskatchewan Regional Training Needs Assessment.

SIAST. 2000. Saskatchewan Economic and Labour Market Overview 2000.

WEBPAGES

Canadian Council for Human Resources in the Environment Industry
www.chrei.ca

Human Resources Development Canada
www.hrdc-drhc.gc.ca

Statistics Canada
www.statcan.ca

Various Post Secondary Educational Institutions